REMARKS

This amendment is in response to the non-final Office action (Paper No. 20031104) mailed 17 November 2003. Claims 1-9, 15, 16, 21-39 and 50-56 are pending in this application. Applicant has amended claims 1, 4, 6, 15, 21, 27, 31, 50 and 54 by this amendment. The substitute specification is submitted to incorporate amendments throughout the specification with both a clean version and a marked-up version. No new matter has been added.

I. Claim Rejections - 35 U.S.C. 102(b) and 35 U.S.C. 103(a)

Claims 1-3, 5-8, 15-16, 21, 23, 25-26, 27, 30, 31, 33-37, 40-53 and 55-56 stand rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Camp et al(Camp) 5,964,905 combined with Petro-Canada Tech Data Sheets for PURITY Grade "Typical Properties and LUMINOL^{R}T White Mineral Oil".

Claims 22 and 32 stand rejected under 35 U.S.C. 102(a) as being unpatentable over Camp et al (Camp) 5,964,905 combined with Petro-Canada Tech Data Sheets for PURITY Grade "Typical Properties and LUMINOL^{R}T "White Mineral Oil" as applied to claims 1-3, 5-8, 15-16, 21, 23, 25-26, 27, 30-31, 33-37, 50-53 and 55-56 above, and further in view of Tsaras 3,844,706.

Claims 24, 28-29, 38-39 and 34 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Camp et al (Camp) 5,964,905 combined with Petro-Canada Tech Data Sheets for PURITY Grade "Typical Properties and LUMINOL^{R}T "White Mineral Oil" as applied to claims 1-3, 5-8, 15-

16, 21, 23, 25-26, 27, 30-31, 33-37, 50-53 and 55-56 above, and further in view of Morrison et al (Morrison) 5,879,694 and 6,066,329.

Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Camp et al (Camp) 5,964,905 combined with Petro-Canada Tech Data Sheets for PURITY Grade "Typical Properties and LUMINOL^{R}T "White Mineral Oil" as applied to claims 1-3, 5-8, 15-16, 21-, 23, 25-26, 27, 30-31, 33-37, 50-53, and 55-56 above, and further in view of C.M. Roland "Kraton G 1600 SEBS".

1. Anticipation - Claims 1-3, 5-8, 15-16, 21, 23, 25-26, 27, 30, 31, 33-37, 40-53 and 55-56

MPEP 2131.03 states that:

"When the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute." The examiner must, in this case, provide reasons for anticipation as well as a motivational statement regarding obviousness. *Ex parte Lee* 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993) (expanded Board)."

Here, Camp '905 does not disclose a specific example which is within a claimed range. For example, the specific example of the triblock copolymer is shown in EXAMPLE 2 (col. 4, lines 10-20; the concentration of triblock copolymer is 7.5 % w/w). (It should be noted that, in view of that

a specific example has a specific concentration, EXAMPLE 1 is not a specific example of the Camp invention because EXAMPLE 1 teaches a general procedure and the **ranges** of the copolymer (*i.e.*, 1 to 20 weight percent of a tribock copolymer), and does not show the specific example of the copolymer concentration. Following the general procedure and the copolymer ranges shown in "EXAMPLE 1," the specific examples are shown in EXAMPLES 2 and 5 (See col. 4, lines 10-11 and col. 5, lines 35-36; "Following the procedure of Example 1.....")

Since the specific examples are not within the claimed ranges, the issue is whether the claimed subject matter was disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute and the examiner provided reasons for anticipation as well as a motivational statement regarding obviousness.

It is clear that the claimed subject matter is a free standing candle. This claimed subject matter is not disclosed in Camp with sufficient specificity to constitute an anticipation for the following reasons.

The examiner stated that "since the relative proportions of hydrocarbon oils and polymer are the same and the said oils and polymers are the same[, the Camp invention] inherently have the same properties."

However, unlike the examiner's assertion, the relative proportions of hydrocarbon oils and polymer are not the same. (Camp discloses the copolymer range of 1 to 20 wt %, but the present invention claims 12 to 27 wt % copolymer.) Rather, the ranges in Camp overlap the claimed ranges. It should be noted again that the fact alone that the ranges in Camp overlap the claimed ranges is not

enough to make an anticipation rejection where no specific example falls within the claimed range. *Ex parte Lee* 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993) (expanded Board). Also, all of the inventions made from Camp do not have the same property because some ranges of Camp are outside of the ranges claimed in the present application. The important issue is whether Camp discloses the claimed invention with sufficient specificity to constitute an anticipation.

The examiner argued that Camp disclosed the free standing property by taking an example of JELL-O™.

"Office personnel must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims. *Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir.) (*en banc*), *aff'd*, U.S., 116 S. Ct. 1384 (1996). An applicant is entitled to be his or her own lexicographer, and in many instances will provide an explicit definition for certain terms used in the claims. Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. *Toro Co. v. White Consolidated Industries Inc.*, 199 F.3d 1295, 1301, 53 USPQ2d 1065, 1069 (Fed. Cir. 1999) (meaning of words used in a claim is not construed in a "lexicographic vacuum, but in the context of the specification and drawings.")." See MPEP §2106.

In the specification of the present application, the term "free standing" composition or candle is explicitly defined as "the composition, such as a candle made with the composition, having the ability to stand by itself at room temperature, such that even during use of a candle made with the composition, such that the heat of the candlewick's combustion does not melt nor deform the body of the candle made with the composition of the present invention." (See page 2, lines 8-12.)

Nonetheless, the examiner regards the term "free standing" as "free standing at room temperature." The example of JELL-O™ is not proper for showing the "free standing" composition or candle defined in the present application.

The examiner also asserted that "[a]nother reason why gel candles are often recommended for use in containers as opposed to being freestanding is due to the potential flowability of a gel candle can be avoided by placing the candle in a container, which is the approach often recommended in the prior art." The examiner's assertion is at most an admission of the problem of the prior art. The specification of the present application explicitly recognized this problem at page 5, lines 4-7. ("Elsamaloty '089 discloses a clear candle could be provided without a container, due to the gel-like nature of the candle itself, and its potential flowability when heated, Elsamaloty '089 discloses that it is preferred that such candles include an appropriate container.") It is clear that Camp also has the same problem because it is a molten candle gel (col. 4, line 64 of Camp) as admitted by the examiner at page 10, line 1 of the Office action. Particularly, with 7.5% and 5.0% copolymer of EXAMPLES 2 and 5 of Camp, the candle which can free-stand at room temperature may be made, but the candle will be softy and sticky, and it will be melted during burning. That is, all the material will get ignite. This is the reason why Camp should use a container. This flowability problem is solved by the present application. The specification of the present application explicitly states that the present invention "is transparent, free standing and elastic, with enough consistency to form a candle with a stable flame, that does not deform upon application of pressure and that **does not get fluid during its use**, such as when the candlewick is burning" at page 10, lines 6-8. (Emphasis added.) One of the novel features of the present invention is that the present invention

does not have the flowability problem. (Camp discloses a molten candle gel as admitted by the examiner at page 10, line 1 in the Office action. (See also column 4, line 64 of Camp.)) Where the present invention solves the flowability problem of the prior art and the examiner admitted the problem of Camp, the examiner improperly used the reasoning, which actually supports the patentability of the present invention, for rejecting claims.

For the foregoing reasons, the claimed subject matter was not disclosed in Camp with "sufficient specificity to constitute an anticipation under the statute even if some ranges are overlapped with the claimed range.

With respect to claim 52, the feature of the density at 20 °C of not less than 0.88 kg/L is not disclosed in Camp. The examiner merely stated that Mineral oil (e.g., PURITY 50 and LUMINOL T 50) inherently would have a density at 20 °C of < 0.88 kg/L. The examiner's assertion is not based on the prior art. PURITY 50 has a density at 25 °C in the range from 0.860-0.880 and a density at 15 °C of 0.874. The references do not show the density at 20 °C, and does show only the densities at 25 °C and 15°C. Also, the disclosed density is at most equal to or less than 0.88 kg/L. From this disclosure, it cannot be said that PURITY 50 has a density of NOT less than 0.88 kg/L at 20 °C. (Unlike the examiner's assertion, claim 52 cites the feature of the density NOT less than 0.88 kg/L.) The examiner's assertion regarding the density is not based on the technical reasoning, and the references do not show that the prior art has the claimed density. (Rather, the density of the prior art teaches away from the claimed invention because the density of the prior art is equal to or less than 0.88 kg/L.) Also, the examiner took the position that since the oils of Camp are white mineral

oils with flash points within the range of the instant claims, the oils of patentee would inherently have the same viscosity and density. It is hardly understood why the fact that the flash point is within the claimed range can be translated to that the density is also within the claimed range. The flash point alone cannot predict the density. The examiner's position is not based on the technical reasoning. If the examiner wants to argue that, if the flash points are the same, the densities are also the same, the examiner must provide its technical reasoning.

With respect to claim 53, the prior art does not disclose the candle being without a container for holding said candle when the candle is lit. Since the feature is not shown in the prior art, the anticipation rejection is not proper.

Therefore, claims 1-3, 5-8, 15-16, 21, 23, 25-26, 27, 30, 31, 33-37, 40-53 and 55-56 are not anticipated by Camp.

2. Obviousness - Claims 1-9, 15, 16, 21-39 and 50-56

Since the claims are not anticipated, the next issue is whether these claims are obvious over Camp et al. combined with Petro-Canada Tech Data Sheets for PURITY Grade "Typical Properties and LUMINOL T "White Oil."

(1) MPEP §2144.05 states that:

"Applicants can rebut a *prima facie* case of obviousness based on overlapping ranges by showing the criticality of the claimed range. "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)."

The examiner's attention is respectfully invited to consider the specification of the present application. In the specification, the applicant stated that

> "when the values of the hydrocarbon oil and copolymer are below the specified values for the composition of the present invention, the composition could be free standing at room temperature but **the heat of the wick's combustion can melt the composition to a liquid point**. On the other hand, when more polymer than what is specified in the present invention is used to harden the compound or composition, the compound or composition can inflame with the combustion produced by the candle's wick." (Page 11, line 21 to page 12, line 5.) (Emphasis added.)

One of the problems recognized by the present invention is the flowability problem. This problem is solved by specifying the concentration of the copolymer. One of the reasons Camp needs a container is that Camp does not expect the "free standing" property which does not have the flowability problem by controlling the copolymer concentration. Camp at most teaches that "[t]he higher the amount of copolymer, the stiffer the gel." This teaching is related at most to the free standing at room temperature. There is no reason to believe that the stiffer the gel, the less the

flowability when the candle is lit. In other words, the melting point of the candle body cannot be predicted from the stiffness alone. Also, merely adding copolymer does not achieve the intended result because, "when more polymer than what is specified in the present invention is used to harden the compound or composition, the compound or composition can inflame with the combustion produced by the candle's wick." (Page 12, lines 3-5.) From the disclosure of Camp, those skilled person in the art would not expect that the control of the copolymer can solve the flowability problem.

The examiner's rejection shows only that the claimed ranges overlap with the ranges disclosed in Camp and asserts that, on the basis of the overlapping ranges, Camp inherently has the claimed property in these overlapping ranges. Even if the ranges overlap, the applicants can rebut a *prima facie* case of obviousness based on overlapping ranges by showing the criticality of the claimed range. The applicant respectfully requests the examiner to consider the above cited holding of *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). ("The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.")

As stated above, the applicant explicitly states why the values of the hydrocarbon oil and the copolymer are important to obtain the "free-standing" candle and that the candles which do not have the claimed ranges cannot "free-stand" during burning.

Conclusively, while the prior art only teaches the molten candle gel or at most the ranges overlapping the claimed ranges, the present invention recognizes the problem of the flowability (*i.e.*, the heat of the wick's combustion can melt the composition to a liquid point) and solved it by showing the criticality of the copolymer and the hydrocarbon oil, which is not taught or suggested in the prior art.

Since the specification clearly shows that the particular range is critical to achieve unexpected results relative to the prior art range, the examiner's rejections of claims 1-9, 15, 16, 21-39 and 50-56 should be withdrawn.

Therefore, claims 1-9, 15, 16, 21-39 and 50-56 are not obvious over the prior art.

In addition, with respect to claim 54, the claim has been amended to show the preferred embodiment using "KRATON G 1652." "If the product to which the trademark refers is set forth in such language that its identity is clear, the examiners are authorized to permit the use of the trademark if it is distinguished from common descriptive nouns by capitalization." MPEP 608.01(v). As cited by the examiner, "Kraton G" with the specific number "1652" is known generally to those skilled in the art, and it is possible for those skilled in the art at that time to practice the applicant's invention. Since a common or generic name for the product is not available and the identity of Kraton G 1652 is clear, the examiner's authorization to permit the use of the trademark is respectfully requested. Here, Camp teaches the use of "KRATON G1650." Unlike "KRATON G 1652," "Kraton G 1650" may cause the flash over problem due to its different molecular mass. Also,

the viscosity of Kraton G 1652 (1,350 Brook"eld) is different from the viscosity of Kraton G 1650 (8,000 Brook"eld), and there is no suggestion or motivation to use Kraton G 1652 rather than Kraton G 1650 in the prior art. Therefore, claim 54 is patentable.

(2) Ascertaining the differences between the prior art and the claims at issue requires interpreting the claim language, and considering both the invention and the prior art references as a whole. In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983)

"[A] patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the 'subject matter as a whole' which should always be considered in determining the obviousness of an invention under 35 U.S.C. § 103." *In re Sponnoble*, 405 F.2d 578, 585, 160 USPQ 237, 243 (CCPA 1969).

Even if the"discovery of the cause of a problem does not always result in a patentable invention, the claimed invention as a whole is patentable because the source of the problem is not identified in the prior art and the remedy is not taught or suggested by the prior art. As stated above, the present invention solves the flowability problem of the prior art candles by controlling the concentration of the hydrocarbon oil, the viscosity and the flash point of the hydrocarbon oil, and

the kind and the concentration of the copolymer. Accordingly, considering the claimed invention as a whole, the claims are not obvious over the prior art.

III. Claim Rejections - 35 U.S.C. 112, second paragraph

Claims 1, 4-5, 6, 7-9, 15-16, 21-22-30, 31, 39, 50 and 51 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 6, 15, 21, 31 and 50 have been amended to more clearly define the present invention by inserting "consisting" between the terms "group" and "of".

IV. Objections - Specification

The disclosure is objected to because of the following informalities: The term "compound" e.g. in line 2 of the first paragraph under The Summary of the Invention and throughout the instant specification should be corrected to read as "composition", especially in light of the correction made to the title of invention.

The term "compound" has been changed to the term "composition" as suggested by the examiner.

V. Objections - Claims

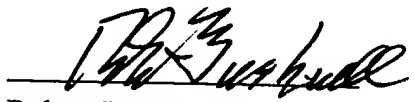
Claims 3, 27 and 54 are objected to because of the informalities.

Claim 3 has been amended to insert "is" between "oil" and "at" for clarity. Claims 27 and 54 have been amended to correct the typographical error"froth" to "forth" in claim 27, line 1, and delete "fo" in claim 54, line 4.

No fee is incurred by this amendment. Should the other fees be incurred, the Commissioner is authorized to charge Deposit Account No. 02-4943 of Applicant's undersigned attorney in the amount of such fees.

In view of the above, it is submitted that the claims of this application are in condition for allowance, and early issuance thereof is solicited. Should any questions remain unresolved, the Examiner is requested to telephone Applicant's attorney.

Respectfully submitted,



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MARKED-UP VERSION OF AMENDMENT

IN THE SPECIFICATION

Please enter the following Substitute Specification in replacement of the originally filed specification.

SUBSTITUTE SPECIFICATION

TITLE

A TRANSPARENT, ELASTIC AND FREE-STANDING COMPOSITION, SUCH AS FOR THE MANUFACTURE OF CANDLES, AND THE FREE-STANDING CANDLE OBTAINED WITH THE COMPOSITION

CLAIM OF PRIORITY

[0001] This application makes reference to, incorporates the same herein, and claims all benefits accruing under 35 U.S.C. § 119 from an application entitled *A TRANSPARENT, ELASTIC AND SELF-SUPPORTING COMPOUND FOR THE MANUFACTURE OF CANDLES AND THE CANDLE OBTAINED WITH SAID COMPOUND* earlier filed in the Argentina National Institute of Industrial Property on September 15, 2000, and there duly assigned Application Number P 000104870 by that Office and another application entitled *A TRANSPARENT, ELASTIC AND FREE-STANDING COMPOUND, FOR THE MANUFACTURE OF CANDLES, AND THE FREE-STANDING CANDLE OBTAINED WITH THE COMPOUND* earlier filed in the Argentina National Institute of Industrial Property on June 21 2001, and there duly assigned Application Number P 010102961 by that Office.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] A main object of this invention is to provide a transparent, elastic and free-standing ~~compound~~ composition, such as for the manufacture of candles, and the candle obtained with this ~~compound~~ composition. The component of the present invention is suitable as a raw material in the manufacture of candles in general, thereby providing new possibilities for the structure of candles, which are difficult to achieve or obtain with the materials that are currently used in the main structure of candles, although possible uses for the ~~compound~~ composition of the present invention should not be construed in a limiting sense. "Transparent" is understood to mean the condition of allowing the passing of the light through the ~~compound~~ composition, such as through the body of a candle. "Elastic" is understood to mean the characteristic of allowing contraction and elongation deformations of the ~~compound~~ composition, when pressing the surface of the ~~compound~~ composition and then the ~~compound~~ composition, such as a candle made with the ~~compound~~ composition, returning to an original shape when the pressure is released.

[0003] Further, " free standing" is understood to mean the ~~compound~~ composition, such as a candle made with the ~~compound~~ composition, having the ability to stand by itself at room temperature, such that even during use of a candle made with the ~~compound~~ composition, such that the heat of the candlewick´s combustion does not melt nor deform the body of the candle made with the ~~compound~~ composition of the present invention.

Description of the Related Art

[0004] Traditional candles are known, such as those to be ignited and give light, which are formed having longer bodies, generally cylindrical, and with a lengthened candlewick included therein in relation to the candle's longitudinal axis. Such traditional candles are manufactured with materials such as paraffin, wax, tallow or stearin. However, such conventional candles have the inconvenience that, though being self supporting, they are not transparent nor elastic, so their decorative and ornamental abilities are limited.

[0005] Also, there is a well-known "oil candle" that is liquid, and therefore, requires a container for its manufacture and for usage of the candle. However, such "oil candle" is typically disadvantageous as to decorative abilities and with respect to the outside structure of the candle since, invariably, such "oil candles" depend on a recipient that contains the fuel. Further, ~~compound~~ compositions for such "oil candles" have to be commercialized separately, since such candle has to be conformed by the user.

[0006] Different realizations disclosing ~~compound~~ composition compositions that can be applied to the formation of candles are known and include a mixture of hydrocarbon oil in a range between 90% and 70% proportion and one or more copolymers selected from a group of triblock and diblock polymers in a range between 2% and 30% proportion. This is due to the fact that, with such proportions, it is possible to form solid and transparent gels that can be molded by thermal treatment. However, it is not disclosed that such above-described transparent gels can conform to the body of a free-standing candle which does not deform nor flash when burned during its use.

[0007] In this regard, U.S. Patent No. 5,879,694 to Morrison *et al.* teaches a solid transparent gel candle including a hydrocarbon oil, a wick, and one or more triblock or multiblock copolymers, which constitute a thermoplastic elastic, and optionally uses a diblock copolymer. The preferred composition disclosed by Morrison *et al.* '694 contains from about 4% to about 20% polymer and about 80% to about 96% of hydrocarbon oil, preferably white oil. The selected polymer is a triblock polymer as " Kraton® G type", more particularly "Kraton® G-1650". In this regard, Morrison *et al.* '694 discloses that preferably, clear glass jars are used for a jar candle.

[0008] Also, US Patent No. 6,066,329 to Morrison *et al.* discloses a transparent stiff gel candle including a hydrocarbon oil, a wick and one or more triblock or multiblock copolymers of a thermoplastic rubber, and optionally, a diblock copolymer. A preferred composition disclosed in Morrison *et al.* '329 contains from about 4 to about 20 percent of the polymer and from about 80 to about 96 percent of a suitable hydrocarbon oil, preferable white oil. A preferred polymer is disclosed as a triblock polymer of the "Kraton® G type" particularly "Kraton® G 1650". Morrison *et al.* '329 also discloses as preferable to hold the candles in conventional jars, clear, colored, sculpted, cut glass jars, and preferably, clear glass jars are used for a jar candle.

[0009] US Patent No. 6,096,102 to Matthäi *et al.* disclose in particular, a candle built of a base material including between 93 and 98 weight percent of hydrocarbon oil "white oil" and between 7 and 10 weight percent of a copolymer selected from the group of tri-block, radial block and multiblock copolymers and between 0 and 10 weight percent of a di-block copolymer. Matthäi *et al.* '102 combines a first component, which is formed by an oil, a copolymer and synthetic paraffin,

with a second component including conventional paraffin, where the first component and the second component are arranged ,alternately, in layers. In addition, Matthäi *et al.* '102 disclose that a transparent glass body is provided which surrounds a region of a candle base material and gives the candle structure.

[0010] US Patent No. 5,578,089 to Elsamaloty discloses a clear candle made with a gel including a mineral oil combined with diblock and triblock copolymers based on synthetic thermal plastic rubbers. The clear candle is disclosed as stable, does not separate and does not flash when burned. The candle, it is disclosed, although free standing at room temperature, will preferably be supplied in a container, and it may be colored and/or scented. However, Elsamaloty '089 discloses that the container for a candle can include any of a variety of devices which can contain the gel, do not burn and do not melt, and, preferably, a faceted glass container can be used for aesthetic purposes. While Elsamaloty '089 discloses a clear candle could be provided without a container, due to the gel-like nature of the candle itself, and its potential flowability when heated, Elsamaloty '089 discloses that it is preferred that such candles include an appropriate container.

[0011] Further, U.S. Patent No. 6,111,055 to Berger *et al.* disclose the use of between 70 and 98 weight percent of hydrocarbon oil with between 2 and 30 weight percent of a copolymer selected from a group of triblock, radial block and multiblock copolymers, and from 0 to 10 weight percent of a diblock copolymer. Berger *et al.* '055 also discloses the combination of a candle with the use of a solid coating placed around the candle to enhance mechanical stability of the gelled body.

SUMMARY OF THE INVENTION

[0012] It is an object, among other objects, of the present invention, to provide a transparent, elastic and free standing ~~compound~~ composition for the manufacture of free standing candles, formed with a mixture of a hydrocarbon oil in a relation of about 75 to about 88 in weight percent, typically 73 to 88 weight percent and desirably 83.8 weight percent, and at least one copolymer selected from the group of triblock polymers and diblock polymers in a proportion from about 12 to about 25 in weight percent, typically 12 to 27 weight percent and desirably 16.2 weight percent where the hydrocarbon oil has a viscosity of at least 180 SUS at 37°C (100°F) and, when the viscosity is in cSt, the viscosity of the hydrocarbon oil being greater than 32 cSt at 40°C (104°F), and the hydrocarbon oil having flash point greater than 220°C (425°F).

[0013] In a preferred embodiment of the ~~compound~~ composition of the present invention, the hydrocarbon oil has a viscosity of 340 SUS at 37°C (100°F) and when the viscosity is in cSt, the hydrocarbon oil has a viscosity greater than or equal to 67.8 cSt at 40°C (104°F), the hydrocarbon oil has a flash point at 240°C (464°F), and the selected copolymers are three-block polymers "Kraton ® G 1652".

[0014] Likewise, it is also the object, among other objects, of the present invention, to provide a free standing candle, manufactured with the mixture of: a hydrocarbon oil in a relation of about 75 to about 88 in weight percent, typically 73 to 88 weight percent and desirably 83.8 weight percent, and at least one copolymer selected from the group of triblock and diblock polymers in a proportion of about 12 to about 25 in weight percent, typically 12 to 27 weight percent and desirably 16.2

weight percent; where the hydrocarbon oil has a viscosity of at least 180 SUS at 37°C (100°F) and when the viscosity is in cSt, the viscosity of the hydrocarbon oil is greater than 32 at 40°C (104°F), and the flash point of the hydrocarbon oil being greater than 220°C (425°F), the candle maintaining a free standing condition when is lit by means of a flame produced as consequence of the combustion of a wick, the wick crossing the body of the candle and projecting toward outside one of its ends. Preferably, the candlewick is a cotton string, imbibed in an alcoholic solution of vegetal resin, such as pine resin. In the present invention due to the elasticity of the candle's ~~compound~~ composition, the candlewick is firmly retained in a passing hole produced when the ~~compound~~ composition of the present invention is cold, the candlewick crossing the body of the candle in longitudinal correspondence to an axis of symmetry extending from an inferior or lower base of the candle.

[0015] Due to the above described special characteristics of the ~~compound~~ composition of the present invention, a free standing candle can be built by the union of a plurality of different format minor portions, wherein the minor portions are and individually made with a mixture of a hydrocarbon oil in a relation of about 75 to about 88 in weight percent, typically 73 to 88 weight percent desirably 83.8 weight percent, and at least one copolymer selected from the group of triblock polymers and diblock polymers in a proportion from about 12 to about 25 in weight percent, typically 12 to 27 weight percent and desirably 16. 2 weight percent, where the hydrocarbon oil has a viscosity of at least 180 SUS at 37°C (100°F) and, when viscosity is in cSt, the viscosity of the hydrocarbon being greater than 32 cSt at 40°C (104°F), and the flash point of the hydrocarbon oil being greater than 220°C (425°F).

[0016] Also, the above-described mixture or composition of the present invention can include dye essences, which can be combined with aromatic fragrances, as well as air bubbles distributed in the part or all of the thickness of the candle and the air bubbles can be of different sizes. Likewise, the candle body of the present invention can include decorative elements arranged in the inner part of the thickness of the candle, which, due to the particular transparency of the ~~compound~~ composition of the present invention, the decorative elements can be visible from outside of the candle, which decorative elements are located in the portion of the ~~compound~~ composition forming the candle not adjacent to the candlewick.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] A more complete appreciation of this invention, and many of the attendant advantages thereof, will be readily apparent as the same becomes better understood by reference to the following detailed description when considered in conjunction with the accompanying drawings in which like reference symbols indicate the same or similar components, wherein:

[0018] Figure 1 is a perspective view illustrating an embodiment of a mold to conform a free standing candle made with the ~~compound~~ composition of the present invention;

[0019] Figure 2 is a perspective view illustrating a free standing candle of the present invention molded in the mold for Figure 1;

[0020] Figure 3 is a perspective view illustrating an embodiment of a free standing candle of the present invention formed by a plurality of minor portions made with the ~~compound~~ composition of the present invention and united one with each other to form a unitary candle body;

[0021] Figure 4 is a schematic perspective view illustrating a free standing inflamed candle of the present invention with the candlewick of the candle consumed to approximately half its height;

[0022] Figure 5 is a schematic perspective view illustrating an embodiment of a free standing inflamed candle of the present invention formed with the ~~compound~~ composition of the present invention, which includes a plurality of lit candlewicks;

[0023] Figure 6 is a schematic perspective view illustrating an embodiment of a free standing candle of the present invention formed with the ~~compound~~ composition of the invention, which includes granule particles, such as "purpurin" as a decorative element;

[0024] Figure 7 is a schematic perspective view illustrating an embodiment of a free standing candle of the present invention formed with the ~~compound~~ composition of the invention, which includes air bubbles; and

[0025] Figure 8 is a schematic perspective view illustrating an embodiment of a free standing candle of the present invention formed with the ~~compound~~ composition of the invention, which includes decorative elements.

DESCRIPTION OF THE INVENTION

[0026] More specifically, the present invention relates to a ~~compound~~ composition obtained from the mixture of hydrocarbon oil, specially white oils, and block copolymers. The present invention relates to a ~~compound~~ composition, such as for use in a candle, that has a consistency to be free-standing, and maintaining elasticity features, while the ~~compound~~ composition maintains transparency, as well as the ~~compound~~ composition enabling the configuring of bodies of various shapes and designs. The ~~compound~~ composition of the present invention, has the special particularity of allowing the incorporation of at least one candlewick in to the candle, similar to those used by candles in general, to provide a combustion of a candle made with the ~~compound~~ composition of the present invention that generates a stable and lasting flame without giving off unpleasant odors.

[0027] The ~~compound~~ composition of the invention has been particularly created for the manufacture of transparent candles which, at the same time are free-standing, that is to say, which do not need a container that supports a candle made from the ~~compound~~ composition of the present invention. Candles made from the ~~compound~~ composition of the present invention also are elastic and unbreakable when they fall or receive sudden knocks, and such candles made from the ~~compound~~ composition of the present invention desirably can be mixed with dyes and aromatic fragrances, as well as can include decorative elements within the candle that are noticeable from outside, or that provide other or inner functional resources related to the art of lighting and decorating different environments.

[0028] The above described composition of the present invention, in summary, advantageously has special qualities: it is transparent, free standing and elastic, with enough consistency to form a candle with a stable flame, that does not deform upon application of pressure and that does not get fluid during its use, such as when the candlewick is burning.

[0029] Using the ~~compound~~ composition of the present invention, it is possible to manufacture candles to have the following desirable features:

a) elasticity, so as to present a consistency solid enough to be self-supporting, without requiring a container for supporting the candle for its normal functioning;

b) resistance or resiliency to mechanical knocking or jarring without generating undesirable breaks, splits or contusions in the candle, as can happen with paraffin candles;

c) transparency, so that light can pass through the body of the candle;

d) the ability to be mixed with fragrances, so that the consumption of the candle during the flame action of burning of the candlewick or wicks also produces the release of pleasant odors;

e) the ability to be mixed with dyes, which is desirable from an aesthetic or ornamental point of view

f) during manufacturing, generating the presence of air bubbles of various sizes such that distribution of air bubbles in the body of the candle can be achieved, which is useful as decorative resources;

g) mixing the ~~compound~~ composition of the present invention with other decorative elements such as various types and sizes of granule particles so as to be distributed in the thickness

of the candle body, so as to be visible from outside of the candle, and decorative elements can be even more enhanced when the candle is lit, such as granule products that reflect light in various colors, such as those commonly called "purpurin" and/or "brilliantine";

h) supporting within the body of the candle of an appropriate thickness, other products or decorative bodies such as letters, numbers, little animals or other objects; and

i) the ~~compound~~ composition of the present invention being a reversible or recyclable ~~compound~~ composition, since upon heating, melting, and then cooling the ~~compound~~ composition to room temperature, the candle formed of the ~~compound~~ composition of the present invention keeps the same constituent features.

[0030] Likewise, it is highlighted that all of the above described features and conditions in relation to the composition of the present invention can be maintained without affecting each other.

[0031] The reasons for the composition of the present invention providing superior and unexpected type results, are related to the chemical characteristics of the hydrocarbon oil, such as a white oil. When the values for the hydrocarbon oil and copolymer specified for the composition of the ~~compound~~ composition of the present invention are maintained, a very special relation between the viscosity and the flash point is achieved. In this regard, when the values of the hydrocarbon oil and copolymer are below the specified values for the composition of the present invention, the ~~compound~~ composition could be free standing at room temperature but the heat of the wick's combustion can melt the ~~compound~~ composition to a liquid point. On the other hand, when more polymer than what is specified in the present invention is used to harden the ~~compound~~

composition or composition, the ~~compound~~ composition or composition can inflame with the combustion produced by the candle's wick.

[0032] The above-described ~~compound~~ composition of the present invention is prepared mixing the hydrocarbon oil with a triblock copolymer, heating this mixture and stirring it regularly until it reaches 150-160° C, which is equivalent to 302-320° F. Stirring the mixture, mechanically or manually, is convenient to achieve the desirable dissolution of the polymer in the hydrocarbon oil. The hydrocarbon oil used for the ~~compound~~ composition of the present invention is desirably white oil ("Vaseline") having the following characteristics as set forth in <TABLE 1>.

<TABLE 1>

Specification	Value	Method
VISCOSITY SUS@ 37.8°C (100°F)	345	ASTMD 88
VISCOSITYcSt@ 40°C (104°F)	32 (67.8)	ASTM D 445
DENSITY @ 20°C (68°F)	0.88	ASTM D 1298
FLASH POINT	240° C (464°F)	ASTM D 97
TURBIDITY POINT	-5° C (23° F)	ASTM D 2500
COLOR AL PT-CO (EX ALPHA)	10	ASTM D 1209
ASTM= American Society for Testing and Material (site:www.astm.org) METHOD= Method of analysis SUS and cSt (centistokes) are measure units of each essay		

[0033] Two of these values for the hydrocarbon oil of TABLE 1 are very important when choosing the hydrocarbon oil, such as the white oil ("Vaseline"), which are: the flash point desirably should not be inferior to or less than 200°C (392 °F) and the viscosity desirably should not be inferior to or

less than 32 cSt, desirably at least 67.8 cSt.

[0034] The other values for the hydrocarbon oil in TABLE 1 can change, dependent upon the specifications of the product, without altering the preparation of the ~~compound~~ composition of the present invention.

[0035] In relation to the triblock copolymer used in the above-described composition or ~~compound~~ composition of the present invention, the most desirable is a triblock copolymer with polystyrene end blocks and a rubbery poly (ethylene butylene) mid block. The polymer used in the preparation of ~~compound~~ composition of the present invention desirably should have the following preferred characteristics as set forth in <TABLE 2>.

<TABLE 2>

Tensile strength, psi	4,500
Elongation at break, %	500
Modulus at 300% extension, psi	700
Film appearance	Clear, water white
Solution viscosity *25% w in toluene,cps	1800
Melt viscosity, melt index, condition G, Gms-10 min	1
Styrene-rubber ratio	30-70
* Brookfield viscosity meter Model RTV to 25°C (77°F)	

[0036] Polymers that better suit the above-described characteristics set forth in <TABLE 2> are Kraton® G 1652 of Shell Chemicals, for example.

[0037] To prepare the above-described ~~compound~~ composition of the present invention, hydrocarbon oils are used that have the feature of remaining liquid within a temperature range between 0°C(32°F) and 200 °C (392°F), as well as the condition of being transparent and of high density. One of the hydrocarbon oils that best adapts to these conditions is a 180 density white oil ("Vaseline"). Likewise, for the composition of the ~~compound~~ composition of the present invention the above-described polymers are used.

[0038] The first step in preparing the composition or mixture of the present invention is to mix two-block or three-block polymers, especially an S-EB-S chain, which are capable of retaining more than twenty times its weight in hydrocarbon oil. Among known polymers suitable for use in the present invention, there are different kinds of polymers, but those of "Kraton® Series G" are the best or preferred for use in the composition or mixture of the present invention. These "Kraton® G" series polymers correspond to a type of three-block polymer, such as "S-EB-S" type. It is also possible to use "Kraton® Series D" type, but they typically do not achieve as good a result as in the previous case. The quantity of polymer to be used in the ~~compound~~ composition or mixture of the present invention relates to the level of hardness intended for the mixture.

[0039] Starting from the previously mentioned elements of the hydrocarbon oil and copolymer, the process then proceeds to mix the mixture of the hydrocarbon oil and copolymer through normal stirring, at a temperature ranging from 80 °C (176°F) to 160 °C (320°F), up to the solubilization of the mixture and that leaves the solution transparent.

[0040] Referring to Fig. 1, for the pouring in molds, materials of container P and mold M of delicate finish and that resist temperatures up to 160 °C may be used. Varying the temperature and speed of pouring of the mixture or ~~compound~~ composition C of the present invention these can be obtained variations in relation to the final finish of the ~~compound~~ composition C of the present invention, which can include air bubbles of different sizes or can be without air bubbles. In Fig. 1 a mold M for the function of forming a candle of the present invention is illustrated, the mold M having a completely open superior or upper base, and the mold M having an internal diameter a and a height b, as illustrated in Fig. 1. For the pouring of the ~~compound~~ composition C from the container P to inside the mold M, the mold M must be able to resist without deforming temperatures of up to 160° C (320 ° F), and in this regard, stainless steel, brass, aluminum, copper , bronze, silicon rubber *etc.* are the most convenient and desirable materials used for the mold M. In relation to the interior surface 1 of the mold M, it is very important that the interior surface 1 be brilliant, neat and polished, so that the ~~compound~~ composition C when formed into a candle of the present invention will have the same neatness and brightness. By changing the temperature and the speed of the pouring of the ~~compound~~ composition C from the container P to inside the mold M, various different finishes can be obtained for the candle of the present invention.

[0041] Once the ~~compound~~ composition C cools in the mold M to room temperature, a completely clear, transparent ~~compound~~ composition without air bubbles is obtained when pouring the ~~compound~~ composition C in the mold M at a temperature between 150°C(302°F) and 160°C (320°F) to provide a clear, transparent candle as candles 100, 100A, 100B and 100C of Figs. 2 through 5.

[0042] When the temperature of the ~~compound~~ composition C is between 100°C(212°F) and 120°C(248°F) when pouring the ~~compound~~ composition C into the mold M, the ~~compound~~ composition C will have air bubbles 2 when it cools to room temperature to provide a clear, transparent candle having air bubbles 2, such as candle 100E of Fig. 7. Air bubbles 2 can also appear in the ~~compound~~ composition C when the speed and the height of the pouring are changed, since that allows the entrance of more air or less air into the ~~compound~~ composition C.

[0043] Figure 2 represents a free standing candle 100 already formed according to the format and dimensions of the mold M of Fig. 1. For the shaping of a candle of the present invention, the ~~compound~~ composition C is capable of keeping the candlewick 3 in a similar way as it is disposed in conventional candles. Conventional paraffin candlewick, as well as candlewicks for gel or especially prepared for these types of candles, such as a cotton string imbibed in a solution of vegetal resin, such as pine resin, can be used for candlewick 3. The candlewick 3 can be placed during the manufacture of the candle, such as candle 100, in the traditional way, that is to say, arranging same in correspondence with the longitudinal axis X of the mold M and the candle extending from a lower base 1a of the candle (Figs. 1 and 2) and fixing the candlewick 3 so as to be stretched or erected so as not to move while the mixture or ~~compound~~ composition C is poured into the mold M.

[0044] It is also possible to place candlewick 3 in the candle by taking advantage of the feature of elasticity of the ~~compound~~ composition C of the present invention. Therefore, once the candle has been shaped in the mold M, these is made an aperture or a passing hole 4 in the candle, such as candles 100B and 100D of Figs. 4 and 6 through which the entire candlewick 3 moves forward till

the candlewick 3 is arranged in a condition of usage in the candle. The passing hole 4 is produced when the candle desirably is at room temperature, the passing hole 4 extending through the candle in longitudinal correspondence to an axis of symmetry L extending from a lower base B of the candle, such as in candles 100B and 100D of Figs. 4 and 6. The candlewick 3 is kept stable in the candle, such as in candles 100B and 100D, without relative displacement due to the mentioned elasticity of the material or ~~compound~~ composition C of the present invention.

[0045] Considering the foregoing, it is possible to shape candles, such as candles 100 through 100F of Figs. 2 through 8, of different sizes and dimensions, which will have a minimum size that depends on the candlewick 3 size used, since the combustion temperature generated and the quantity of adjacent material melted of the candle depends on the type and proportions of the candlewick 3 used in the candle. It is possible to manufacture candles of different forms and sizes taking into account the candlewick 3´s thickness and the melting diameter of the candle in relation to candle's minimum diameter.

[0046] In the candles of the present invention, such as candles 100 through 100F, providing a candle diameter larger than the melting diameter of the candle, a decorative effect can be achieved that is highly pleasant, since the portion of the material or ~~compound~~ composition C in the candle that is not melted keeps its original structure. For example, a candle of a diameter which is twice the melting diameter of the candle produced during the combustion of a candlewick 3, 3a, 3b, 3c, produces a tunneling 5, 5a, 5b, 5c since the candlewick´s flame 6, 6a, 6b, 6c will melt a certain diameter of the ~~compound~~ composition C around the candlewick 3, 3a, 3b, 3c but the rest of the

candle will remain unchaged. The flame 6, 6a, 6b, 6c consumes the candlewick 3, 3a, 3b, 3c during the combustion and, as consequence, the candlewick 3, 3a, 3b, 3c- is shortened by such combustion, and the light produced by the flame 6, 6a, 6b, 6c inside the candle, such as candles 100B through 100F of Figs. 4 through 8, for example, will go through the transparent body of the candle achieving a very special, beautiful and unique effect.

[0047] Fig. 3 illustrates a free standing candle 100A of the present invention built with a plurality of minor portions 7, 8 and 9 of the ~~compound~~ composition C, the minor portions being of different sizes and forms. The minor portions 7, 8 and 9 forming the candle 100A can be formed by different methods, such as molding, lamination, extrusion, *etc.* When the minor portions 7, 8 and 9 are united one with the other to form a unitary structure, a free standing candle 100A as illustrated in Fig. 3, having properties of candles of the present invention, as previously mentioned is provided.

[0048] The ~~compound~~ composition C's shapes and formats obtained for the above-mentioned minor portions, such as minor portions 7, 8 and 9, can be laminar, cylindrical, rectangular, and any other suitable design. By using heat to melt the ~~compound~~ composition C of the present invention in the desired joint point J of two of the minor portions obtained, the melted ~~compound~~ composition of both minor portions will mix and, once cooled, the minor two portions are united forming one single piece of a unitary structure. This allows an artist, for example, to design and manufacture candles of varying shapes and designs by making and joining minor portions formed of the ~~compound~~ composition C of the present invention having different colors, finishes and shapes.

[0049] Referring to Fig. 5, an embodiment of a candle 100C of the present invention is illustrated formed of the composition C of the present invention that allows the formation of free standing candles of a relatively large diameter so as to allow the placing of more than one candlewick 3 in the candle. In the candle 100C of Fig. 5, a plurality of candlewicks 3a, 3b, 3c are illustrated which are reduced by their combustion generating tunnelings 5a, 5b, 5c lightened with flames 6a, 6b, 6c.

[0050] Further, the ~~compound~~ composition C of the present invention also allows the possibility of ~~compound~~ composition C of candles 100 through 100F of Figs. 2 through 8 being mixed with colorants by adding dyes to color the ~~compound~~ composition C and, also, the ~~compound~~ composition C of candles 100 through 100F of Figs. 2 through 8 can be mixed with aromatic fragrances to perfume the ambient air during the combustion of the candlewicks 3a, 3b, 3c.

[0051] Additionally, Fig. 6 illustrates a candle 100D of the present invention where the ~~compound~~ composition C of the present invention has been mixed with a granular material 10, such as "purpurin", for example.

[0052] Also, Fig. 8 illustrates a candle 100F of the present invention where the body of the candle 100F has a plurality of different decorative elements 11a through 11d, for example, distributed in the interior of the candle 100F. The placing of the decorative elements 11a through 11d, for example, in the body of the candle 100F can be allowed by placing the decorative elements 11a through 11d, for example, in the ~~compound~~ composition C of the present invention once is poured from container P into the mold M (Fig. 1) and before the ~~compound~~ composition cools to room or ambient temperature. Such decorative elements can also include a logo, a name, a picture, an object,

etc., for example, set in the ~~compound~~ composition C of the candle before cooling of the ~~compound~~ composition to room or ambient temperature. The ~~compound~~ composition C of the present invention will hold the decorative elements 11a through 11d, for example, and, due to the ~~compound~~ composition C's transparency, the decorative elements 11a through 11d, for example, will be visible from outside of the candle, such as illustrated in candle 100F of Fig. 8.

[0053] The following Examples 1 and 2 are now described to illustrate exemplary embodiments of the ~~compound~~ composition or mixtures and candles of the present invention.

Example 1:

[0054] A mixture of the present invention containing white oil in a relation of 75 to 88 weight percent and a three-block polymer of "Kraton® G series" type in a relation of 25 to 12 weight percent was prepared. This ~~compound~~ composition was obtained heating the mixture at a temperature ranging between 100° C (212° F) and 160°C (320° F), desirably 150° C (302° F) to 160°C (320° F), stirring till the mixture becomes clear and transparent. In this case, a dye and an aromatic fragrance were added and the obtained mixture was poured in a cylindrical mold of 7 cm diameter and 7 cm of height proceeding to its cooling and hardening.

[0055] Once the mixture of ~~compound~~ composition is cooled, at room temperature, the demolding was accomplished and the placement of the candlewick or wick was performed. In this case the candlewick was formed by a cotton string imbibed in an alcoholic solution of pine resin. A passing aperture or passing hole in correspondence to the axis of symmetry of the cylindrical body of the

candle was formed, in which the candlewick was introduced. From the above-described process, a free standing, transparent and color candle was obtained. The candle thus formed kept a flame, as a product of the combustion generated from the candlewick, which flame maintained constant during 40 continuous hours of burning.

Example 2:

[0056] A mixture of the present invention of hydrocarbon oil and copolymer similar to that of Example 1 was prepared, and, previous to the stage of cooling, the mixture or ~~compound~~ composition thus prepared was poured in a plurality of different molds to provide a plurality of minor portions. These minor portions poured into the plurality of different molds were mixed with different coloring essences and then exposed to cooling individually, as explained previously. In this regard, different forms and shapes of ~~compound~~ compositions were obtained, such as sheets of different sizes, strings of different thickness, as well as portions without defined format, all of them in varying colors, as explained previously.

[0057] Using the above-mentioned minor portions in a solid state, a handmade design of different structures were performed assigned to shape candles; and the plurality of different minor portions were joined together, applying heat, thus obtaining candle bodies of different shapes and sizes, as explained previously, having a unitary structure for the candle body formed from the different minor portions. A corresponding candlewick was introduced in the body of the thus formed candle, following the same method explained in the previous Example 1.

[0058] While there have been illustrated and described what are considered to be preferred embodiments of the present invention, it will be understood by those skilled in the art that various changes and modifications may be made, and equivalents may be substituted for elements thereof without departing from the true scope of the present invention. In addition, many modifications may be made to adapt a particular situation to the teaching of the present invention without departing from the scope thereof. Therefore, it is intended that the present invention not be limited to the particular embodiments disclosed as the best mode contemplated for carrying out the present invention, but that the present invention includes all embodiments falling within the scope of the appended claims.

IN THE ABSTRACT

ABSTRACT

A ~~compound~~ composition includes a mixture of a hydrocarbon oil in a relation of about 75 to 88 in weight percent and at least one copolymer selected from the group of triblock and diblock polymers in a proportion from about 12 to 25 in weight percent, the hydrocarbon oil having a viscosity of at least 180 SUS@ at 37°C (100°F) and, when the viscosity is in CST@, the viscosity being greater than 32 CST@ at 40°C (104°F), and the flash point being greater than 220°C (425°F). Also a free standing candle is made with the ~~compound~~ composition, the candle maintaining a free standing condition even when lit by means of a flame produced as a consequence of the combustion of a wick that crosses the body of the candle projecting toward outside one of its ends.